

REMARKS

In view of the above amendments and the following remarks, reconsideration of the objections and rejections set forth in the Office Action of January 25, 2005 is respectfully requested.

The specification has now been amended in order to provide antecedent basis in the specification for a new dependent claim added by this Amendment. Because the relevant subject matter was clearly illustrated in original figure 2, it is submitted that no new matter has been added by this Amendment. Therefore, the Examiner is respectfully requested to enter the above amendment to the specification.

The Examiner objected to claim 31 due to an informality. However, as indicated above, original dependent claim 31 has been cancelled. Therefore, it is submitted that the Examiner's objection to claim 31 has been obviated.

In view of the Amendment filed November 10, 2004, claims 18, 19, 21-26, 28-35, and 37 were pending and examined in the outstanding Office Action of January 25, 2005. In this regard, the Examiner rejected all of the pending claims under 35 U.S.C. § 102(e) as being anticipated by the Yamada reference (USP 6,570,469). However, independent claim 18 has now been amended so as to further distinguish the invention recited in that claim from the prior art as applied by the Examiner. In addition, as explained to the Examiner during the interview of May 23, 2005, it is submitted that the structure recited in original independent claim 32 is clearly distinguishable from the prior art. Therefore, for the reasons discussed below, it is respectfully submitted that amended independent claim 18 and original independent claim 32, as well as the claims that depend therefrom, are clearly patentable over the prior art of record.

Amended independent claim 18 is directed to a multi-layer board that comprises a first resin layer *on a first side of a ceramic layer so as to contact the ceramic layer*, and the first resin layer has a dielectric constant lower than the dielectric constant of the ceramic layer. The board further comprises a second resin layer *on a second side of the ceramic layer so as to contact the ceramic layer*, and a third resin layer *on the first resin layer so as to contact the first resin layer*. A strip line is provided *between* the first resin layer and the third resin layer.

The Yamada reference discloses a multi-layer ceramic device including a ceramic layer 15. In the Office Action, the Examiner asserted that the Yamada reference discloses a first resin layer 17 over a first side of the ceramic layer 15 as shown in figure 4, and that the first resin layer 17 has a dielectric constant lower than the dielectric constant of the ceramic layer 15 (as explained in column 6, line 5). The Examiner also asserted that the Yamada reference discloses a third resin layer 6 over the first resin layer 17, and a strip line 12 that is arranged “on” the first resin layer 17.

As explained in column 16, lines 10-15 and illustrated in figures 3 and 4 of the Yamada reference, reference number 12 of the Yamada reference identifies a circuit pattern formed *within a ceramic layer 19*. In other words, reference number 12 does not identify a strip line between a first resin layer (such as resin layer 17) and a third resin layer (such as resin layer 6) formed on the first resin layer so as to contact the first resin layer. In fact, the Yamada reference does not even disclose or suggest *a strip line between a first resin layer and a third resin layer*, as recited in amended independent claim 18. Therefore, it is submitted that the Yamada reference does not anticipate or even render obvious the invention recited in amended independent claim 18. Accordingly, it is respectfully submitted that amended independent claim 18 and the claims that depend therefrom are clearly patentable over the prior art of record.

Independent claim 32 is directed to a multi-layer board that comprises a ceramic layer, an impedance element, a resin layer, and a ground pattern. These elements are arranged in a specific structural manner as recited in claim 32 in order to achieve an increased Q-factor of the pattern inductor.

In order to illustrate an example of the structural relationship between the elements recited in claim 32, reference will now be made to the embodiment shown in figure 1. However, reference to the present application is not intended to limit the scope of claim 32 to any particular embodiments set forth in this application, and is provided only to aid in the Examiner’s understanding of the present invention.

The impedance element of claim 32 includes a patterned inductor 13 on the ceramic layer 11. A resin layer 18 is provided over the first side 11a of the ceramic layer 11, and the resin layer

18 has a first side that faces the first side 11a of the ceramic layer 11 and has a second side 18a opposite the first side of the resin layer. A ground pattern 19 is formed on the second side 18a of the resin layer 18. As shown in the attached Appendix (a marked-up copy of Fig. 1), the ground pattern and the patterned inductor 13 are arranged so that no portion of the ground pattern 19 is located on a portion of the second side 18a of the resin layer 18 opposite a portion of the first side of the resin layer 18 facing the pattern inductor 13 so as to thereby increase a Q-factor of the pattern inductor. The arrangement of the patterned inductor 13 and the ground pattern 19 as described above is highlighted in green and yellow in the attached Appendix for the Examiner's benefit. In particular, the ground pattern (in yellow) is located opposite the patterned inductor (in green) with respect to the resin layer 18.

In the outstanding Office Action, the Examiner asserted that the Yamada reference discloses a ceramic layer 15 and a resin layer 17 over the first side of the ceramic layer 15. The Examiner further asserted that the circuit pattern 12 of the Yamada reference corresponds to the patterned inductor recited in claim 32. However, as illustrated in figures 3 and 4 of the Yamada reference, the circuit pattern (patterned inductor according to the Examiner) is not formed on the ceramic layer 15.

In the discussion of claim 32 on page 4 of the Office Action, the Examiner asserted that a power line is equivalent to a ground line (i.e., is equivalent to a ground pattern as recited in claim 32), and that the Yamada reference discloses a power line 7. Assuming, for the sake of argument, that the land grid array 7 of the Yamada reference *is* a ground pattern as asserted by the Examiner, the land grid array 7 is not arranged as required by claim 32. In particular, although the land grid array is formed on an adhesive resin 18, the land grid array 7 is not formed on the second side of the resin layer 17 (which is the same resin layer formed over the first side of the ceramic layer as asserted by the Examiner). Thus, it is submitted that the Yamada reference also does not disclose or even suggest a ground pattern on a second side of a resin layer, as recited in claim 32. Furthermore, it is submitted that the Yamada reference does not disclose or even suggest the arrangement of the patterned inductor and ground pattern so as not to oppose each other, as also recited in claim 32 and explained above.

During the interview of May 23, 2005, the Applicant's representative attempted to explain to the Examiner that the Yamada reference does not disclose or even suggest the arrangement of the components of a multi-layer board as recited in claim 32. In this regard, the Examiner is requested to note that the Applicant is not asserting that a patterned inductor, a resin layer, a ceramic layer, or a ground pattern were not previously known in the art. Instead, the Applicant submits that the *recited arrangement of these elements* is novel and non-obvious. It is not proper for the Examiner to simply assert that the prior art discloses these individual elements without also asserting that the prior art discloses or at least suggests the recited *arrangement* of these components as recited in claim 32. As explained above, it is submitted that the Yamada reference does not disclose or even suggest the specific arrangement of the pattern inductor, the resin layer, the ceramic layer, and the ground pattern as recited in claim 32. Accordingly, it is submitted that independent claim 32 and the claims that depend therefrom are clearly patentable over the prior art of record.

At the completion of the interview of May 23, 2005, the Examiner stated that he will reexamine the rejections of claim 32, and will possibly search for and apply additional prior art. If the Examiner should again reject claim 32 in view of the prior art, the Examiner is strongly and respectfully requested to specifically identify and explain how the reference or combination of references teaches or suggests all of the structural elements recited in claim 32, including *the arrangement* of the structural elements recited in claim 32.

Finally, in view of 35 U.S.C. § 103(c), the Examiner is requested to note that the subject matter of the Yamada reference and the subject matter recited in the claims pending in this application were, at the time the present invention was made, both owned by or subject to an obligation of assignment to Matsushita Electric Industrial Co., Ltd. (i.e., the same "person").

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. However, if the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the Applicant's undersigned representative.

Respectfully submitted,

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